UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 09/940,139 | 08/27/2001 | Ross Saunders | 2545-000005 | 3935 |

27572 7590 11/16/2005

HARNESS, DICKEY & PIERCE, P.L.C.
P.O. BOX 828
BLOOMFIELD HILLS, MI 48303

| EXAMINER | |
|---|---|
| BELLO, AGUSTIN | |
| ART UNIT | PAPER NUMBER |
| 2633 | |

DATE MAILED: 11/16/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

MAILED

NOV 1 6 2005

GROUP 2600

**BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

Application Number: 09/940,139
Filing Date: August 27, 2001
Appellant(s): SAUNDERS, ROSS

Timothy D. MacIntyre
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed 06/22/05 appealing from the Office action mailed 01/25/05.

**(1) Real Party in Interest**

A statement identifying by name the real party in interest is contained in the brief.

**(2) Related Appeals and Interferences**

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**(3) Status of Claims**

The statement of the status of claims contained in the brief is correct.

**(4) Status of Amendments After Final**

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

**(5) Summary of Claimed Subject Matter**

The summary of claimed subject matter contained in the brief is correct.

**(6) Grounds of Rejection to be Reviewed on Appeal**

The appellant's statement of the grounds of rejection to be reviewed on appeal is substantially correct. The changes are as follows: Claims 1, 2, 5, and 7-11 are rejected as being unpatentable over Roberts. Claim 3 is rejected as being unpatentable over Roberts in view of Bergano. Claim 4 is rejected as being unpatentable over Roberts in view of Barnard. Claim 6 is rejected as being unpatentable over Roberts in view of Fatehi.

**(7) Claims Appendix**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(8) Evidence Relied Upon**

| | | |
|---|---|---|
| 5,963,312 | Roberts | 10-1999 |
| 6,744,992 | Bergano | 6-2004 |
| 6,742,154 | Barnard | 05-2004 |
| EP0580316A1 | Fatehi | 01-1994 |

**(9) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

**DETAILED ACTION**

***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-2, 5, and 7-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Roberts (U.S. Patent No. 5,963,312).

Regarding claim 1, Roberts teaches a method for isolating faults in an optical path of an optical network having a plurality of optical elements (column 1 lines 5-26; column 7 lines 23-25), comprising: transmitting an optical signal through the optical network (e.g. "optical transmission system for transmitting data" of column 2 lines 15-19), the optical signal having error detection data embedded therein (e.g. "test pattern" "multiplexed" or "interleaved" with the data traffic of column 2 lines 61-67), determining an error rate for the optical signal at an egress

point of the optical network (column 3 lines 45-47 and column 6 lines 44-46), where the error rate is based on the error detection data embedded in the optical signal (e.g. "only the lower speed digital test signal" of column 6 lines 1-5 and column 6 lines 28-32); dithering the optical signal by varying an amplitude of the optical signal at two or more of said plurality of optical elements (e.g. "test signal" of column 7 lines 54-67 and shown in Figure 8; by adjusting the gain of the optical amplifiers of the system), and monitoring the error rate for the optical signal at the egress point of the optical network (e.g. "recovers test pattern in the manner described previously" of column 7 lines 56-58, and via the "eye" of column 6 lines 6-27 or the "BER counter" of column 6 lines 28-37), thereby isolating where a fault occurs in the optical network ("FAULT LOCATION INFORMATION" OF Figure 6 and described in column 1 lines 5-26; column 7 lines 23-25). Roberts further teaches introducing a dither control signal into the optical signal at two or more of the optical elements by adjusting the gain of optical amplifiers of the system in response to error rate and fault location information (column 7 lines 35-36, Figure 6). As noted by the Appellant (paragraph 0023 of the specification), adjusting the gain of an amplifier is a readily recognizable method for introducing a dither control signal into an optical signal.

Roberts differs from the claimed invention in that Roberts fails to specifically teach the use of partial regenerators. However, the Appellant admits that partial regenerators are well known in the art (paragraph 0003 of the specification). One skilled in the art would have been motivated to use partial regenerators in the system of Roberts since they are known to provide lower cost and less power consumption, as noted by the Appellant. Furthermore, Roberts specifically teaches that the method of the patent is applicable to other optical elements that

process optical signals in an optical path (column 4 lines 31-35), thereby including partial regenerators. One skilled in the art could reasonable expect to succeed in using partial regenerators in the system of Roberts since Roberts teaches an optical transmission system and further that the method is applicable to a wide variety of optical elements. Therefore, it would have been obvious to one skilled in the art at the time the invention was made that partial regenerators could have been included in the device of Roberts and that the method disclosed by Roberts could have been applied to the partial regenerators of the system.

Regarding claim 2, Roberts differs from the claimed invention in that Roberts fails to specifically teach that the step of transmitting an optical signal further comprises embedding error detection data in the B1 byte of a data frame in accordance with SONET protocol. However, as noted by the Appellant (paragraph 0014 of the specification), embedding error detection data in the B1 byte of a data frame in accordance with SONET protocol for the purpose of error rate derivation is well known in the art. One skilled in the art would have been motivated to do so in order to use the same optical frequency as the data traffic for the error detection data (column 2 lines 64-67 of Roberts). One skilled in the art could reasonable expect to succeed in embedding error detection data in the B1 byte of a data frame in accordance with SONET protocol since Roberts also teaches that the error detection data of the system could be bit interleaved with the data traffic (column 5 lines 41-55) and mentions the compatibility of doing so with the SONET protocol. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to embed error detection data in the B1 byte of a data frame in accordance with SONET protocol as is well known in the art in the system of Roberts.

Regarding claim 5, Roberts teaches that the step of introducing a dither control signal further comprises introducing the dither control signal at a transmitter in the optical path (reference numeral 1 or 81 in Figure 8), thereby assessing if a fault exists downstream from the transmitter (via the upper monitoring receiver or lower monitoring receiver 82 in Figure 8).

Regarding claim 7, Roberts teaches the steps of introducing a dither control signal (e.g. "adjusting the gain" of column 7 lines 35-36) and monitoring the error rate for the optical signal (e.g. "recovers test pattern in the manner described previously" of column 7 lines 56-58, and via the "eye" of column 6 lines 6-27 or the "BER counter" of column 6 lines 28-37) are performed only when the error rate for the optical signal exceeds a predetermined threshold error rate indicative of a fault in the optical network (e.g. "corrective action" of column 6 lines 55 column 7 line 9). Roberts teaches introducing a dither control signal into the optical signal at two or more of the optical elements as a corrective action by adjusting the gain of optical amplifiers of the system in response to error rate and fault location information (column 7 lines 35-36, Figure 6). As noted by the Appellant (paragraph 0023 of the specification), adjusting the gain of an amplifier is a readily recognizable method for introducing a dither control signal into an optical signal.

Regarding claim 8, Roberts teaches a method for isolating faults in an optical path of an optical network having a plurality of optical elements (column 1 lines 5-26; column 7 lines 23-25), comprising: transmitting an optical signal through the optical network (e.g. "optical transmission system for transmitting data" of column 2 lines 15-19), determining a baseline error rate for the optical signal at an egress point of the optical network (e.g. "threshold" which "can be set" and therefore determined of column 7 lines 7-9); introducing a dither control signal into

the optical signal at a first optical element (e.g. "test pattern" "multiplexed" or "interleaved" with the data traffic of column 2 lines 61-67), determining a first error rate for the optical signal at the egress point of the optical network (e.g. "recovers test pattern in the manner described previously" of column 7 lines 56-58, and via the "eye" of column 6 lines 6-27 or the "BER counter" of column 6 lines 28-37 and "From First Monitor" of Figure 5); and evaluating the first error rate in relation to the baseline error rate (reference numeral 56 in Figure 5), thereby assessing if a fault exists downstream from the first partial regenerator (e.g. "Yes" "No" decision after block 56 in Figure 5). Roberts differs from the claimed invention in that Roberts fails to specifically teach the use of partial regenerators. However, the Appellant admits that partial regenerators are well known in the art (paragraph 0003 of the specification). One skilled in the art would have been motivated to use partial regenerators in the system of Roberts since they are known to provide lower cost and less power consumption, as noted by the Appellant. Furthermore, Roberts specifically teaches that the method of the patent is applicable to other optical elements that process optical signals in an optical path (column 4 lines 31-35), thereby including partial regenerators. One skilled in the art could reasonable expect to succeed in using partial regenerators in the system of Roberts since Roberts teaches an optical transmission system and further that the method is applicable to a wide variety of optical elements. Therefore, it would have been obvious to one skilled in the art at the time the invention was made that partial regenerators could have been included in the device of Roberts and that the method disclosed by Roberts could have been applied to the partial regenerators of the system.

Regarding claim 9, Roberts teaches introducing a dither control signal into the optical signal at a transmitter residing in the optical path (e.g. "test signal" of column 7 lines 54-67 and

shown in Figure 8 and reference numeral 1 or 81 in Figure 8); determining a first error rate for the optical signal at the egress point of the optical network; and evaluating the first error rate in relation to the baseline error rate (e.g. "recovers test pattern in the manner described previously" of column 7 lines 56-58, and via the "eye" of column 6 lines 6-27 or the "BER counter" of column 6 lines 28-37 and "From First Monitor" of Figure 5), thereby assessing if a fault exists downstream from the transmitter (via the upper monitoring receiver or lower monitoring receiver 82 in Figure 8).

Regarding claim 10, Roberts obviates the use of partial regenerators as discussed regarding claim 8, and teaches (a) introducing a dither control signal into the optical signal at a second partial regenerator located downstream from the first partial regenerator (e.g. "test signal" of column 7 lines 54-67 and shown in Figure 8 and reference numeral 81 in Figure 8), (b) determining a second error rate for the optical signal at the egress point of the optical network (e.g. "From Penultimate Monitor" of Figure 5); and (c) evaluating the second error rate in relation to the baseline error rate (reference numeral 51 in Figure 5), thereby assessing if a fault exists downstream from the second partial regenerator (e.g. "Yes" "No" decision after block 51 in Figure 5).

Regarding claim 11, Roberts obviates the use of partial regenerators as discussed regarding claim 8, and further teaches repeating steps (a) thru (c) for each of said plurality of optical elements in the optical network (as is evident from Figure 5, "From First Monitor" "From Penultimate Monitor" "From End Receiver").

3. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Roberts in view of Bergano (U.S. Patent No. 6,744,992).

Regarding claim 3, Roberts differs from the claimed invention in that Roberts fails to specifically teach that determining an error rate further comprises calculating Q for the optical signal at the egress point of the optical network. However, determining an error rate by calculating Q for an optical signal at the egress point of an optical network is well known in the art. Bergano, in the same field as optical communication, teaches determining an error rate by calculating Q (reference numeral 605 in Figure 6) for an optical signal at the egress point of an optical network. One skilled in the art would have been motivated to determine the error rate by calculating Q for an optical signal in order to determine transmission performance of the signals after propagation through the system (column 7 lines 29-36 of Bergano). Furthermore, as noted by the Appellant (paragraph 0018 of the specification), the relationship between Q and the bit error rate BER is well known in the art. As such, one skilled in the art would clearly have recognized the relationship between the BER of Roberts (column 6 lines 28-32) and the method of calculating Q taught by Bergano. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to determine an error rate by calculating Q for an optical signal at the egress point of an optical network as taught by Bergano in the system of Roberts.

4. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Roberts in view of Barnard (U.S. Patent No. 6,742,154).

Regarding claim 4, Roberts differs from the claimed invention in that Roberts fails to specifically teach that the step of determining an error rate further comprises deriving the error rate from the number of corrected errors in a forward error correction scheme. However, determining an error rate by deriving the error rate from the number of corrected errors in a forward error correction scheme is well known in the art. Barnard, in the same field of optical

communication, teaches it is well known in the art to derive an error rate from the number of corrected errors in a forward error correction scheme (abstract). One skilled in the art would have been motivated to derive the error rate in this manner in order to balance the performance of different channels (column 2 lines 47-57 of Barnard). One skilled in the art could reasonable expect to succeed in implementing the method of Barnard in the system of Roberts since Barnard teaches that the method is particularly applicable to fiber optic communication networks such as that taught by Roberts. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to derive an error rate from the number of corrected errors in a forward error correction scheme as taught by Barnard in the system of Roberts.

5. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Roberts in view of Fatehi (EP 0580316 A1).

Regarding claim 6, Roberts obviates the use of partial regenerators and teaches introducing a dither control signal to each of those optical elements in an effort to assess if a fault exists downstream from a given partial regenerator as discussed regarding claim 1. Roberts differs from the claimed invention in that Roberts fails to specifically teach that the step of introducing a dither control signal further comprises sequentially introducing the dither control signal at each of said plurality of partial regenerators, thereby assessing if a fault exists downstream from a given partial regenerator. However, sequentially introducing a dither control signal in order to determine fault location is a well-known concept. Fatehi, in the same field of optical communication, teaches that this concept is well known in the art (column 1 line 52 – column 2 line 8). One skilled in the art would have been motivated to sequentially introduce the dither control signal, as Fatehi teaches is well known in the art, in the system of Roberts in order

to reduce the number of monitoring receivers, thereby reducing the overall cost of the system (column 2 lines 6-8 of Fatehi). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to introduce a dither control signal sequentially at each of said plurality of partial regenerators, thereby assessing if a fault exists downstream from a given partial regenerator as is well known in the art according to Fatehi in the system of Roberts.

**(10) Response to Argument**

As background and basis for the examiner's response to the Appellant's argument, the examiner provides a brief explanation of what it means to regenerate a signal in the optical context.

When an optical signal from an optical transmitter is introduced into a transmission medium such as an optical fiber and is made to traverse the transmission medium towards a distant receiver, the signal begins to lose its shape, its timing, and its amplitude as it traverses the transmission medium. In order to prevent the optical signal from completely degrading into an incoherent and unrecoverable signal, regeneration of the optical signal to its original transmission characteristics via a device known as a regenerator is required at predetermined intervals along the length of the fiber.

However, the terms "regeneration" and "regenerator," while widely used in the optical context, are loosely defined. At minimum they include *one of* reshaping, retiming, or re-amplification of the input optical signal while at maximum involve *each of* reshaping, retiming, and re-amplification of the input optical signal. Each individual step addresses a particular degradation experienced by the optical signal with combinations of the steps selected according to the desired level of signal cleanliness, i.e. how close the regenerated signal resembles the

originally transmitted signal. In practice, a regenerator can be deployed as a 1R, 2R, or 3R regenerator, depending upon whether it serves as a re-amplifier (1R:re-amplify), a remodulator (2R: reshape and re-amplify), or a full regenerator (3R: reshape, retime, and re-amplify).

The Appellant's main point of contention with the examiner's office action is the apparent lack of disclosure in the cited references for an element the Appellant terms a "partial regenerator." However, considering that complete regeneration of an optical signal entails reshaping, retiming, *and* re-amplifying the optical signal, it stands to argue that a partial regenerator, when given the broadest reasonable interpretation, only performs a fraction of the actions performed by a full regenerator, namely, only 1R (1R:re-amplify) or 2R (2R: reshape and re-amplify).

In Roberts, disclosure is given that an optical amplifier can be included in the system as one of the optical elements 2 in Figures 1 and 6-8; the optical amplifier performing only amplification of an input optical signal, thus acting as a 1R regenerator. As such, and given the broadest reasonable interpretation, the examiner asserts that the amplifier of Roberts can be considered a partial regenerator in the sense that it re-amplifies the signal, but does not reshape and/or retime the signal as required to achieve full regeneration.

Turning to the Appellant's own specification, the Appellant, consistent with the examiner's explanation of 2R regenerators provided above, defines a conventional regenerator as being capable of removing noise (e.g. re-amplification) and distortion (e.g. reshaping) from a signal (specification paragraph [0002]). However, the Appellant then departs from the accepted meaning of regenerators by disclosing that some regenerators are also capable of performing signal error checking that enables sectionalization of errors in optical networks. More

importantly, Appellant then more clearly distinguishes partial regenerators from conventional regenerators by defining partial regenerators as elements that do not perform signal error checking and offer a smaller foot print, less power consumption, and can be found at a lower cost. The disputed ability of a regenerator to check for errors aside, it stands to reason that the 1R regenerator of Roberts also meets the Appellant's definition of a partial regenerator in that it too offers a smaller footprint, less power consumption, and lower cost when compared to other regenerators in that it does not include the reshaping element required in a 2R regenerator, and likewise does not include the reshaping and retiming elements found in full 3R regenerators.

Furthermore, the fact that the regenerator of Roberts is a simple 1R regenerator comprising an optical amplifier serving only to re-amplify an input optical signal with no mention of or structure to perform error checking leads one to believe that the 1R regenerator of Roberts is a single function element. Moreover, Roberts specifically provides a structure apart and distinct from the optical amplifier whose sole purpose is that of performing signal error checking. The distinct structure performs signal error checking via a test signal inserted at the input of the optical amplifier and monitoring of the test signal output from the optical amplifier the result of which then enables sectionalization of errors in an optical network. That Roberts teaches an error checking apparatus apart from the 1R regenerator provides further supporting evidence that the 1R regenerator of Roberts can be considered as equivalent to the partial regenerator disclosed and claimed by the Appellant, in that the 1R regenerator of Roberts in and of itself does not include the ability to perform signal error checking that enables sectionalization of errors in an optical network. Rather, the regenerator of Roberts simply re-amplifies the input

optical signal while the elements outside of the 1R regenerator of Roberts perform the error signal checking and sectionalization of errors in the optical network.

Given the above, it is becomes clear that Roberts' suggestion or disclosure of a partial regenerator is twofold. First, the 1R regenerator of Roberts can be considered as a partial regenerator when one considers that it only performs a part of the complete regeneration of an optical signal, i.e. re-amplification. Second, the 1R regenerator of Roberts meets the Appellant's own definition of a partial regenerator by not performing signal error checking at the regenerator and offering a smaller footprint, less power consumption, and lower cost when compared to other fully featured regenerators. As such, the examiner has concluded in the office action and maintains now that Roberts at minimum suggests and at most discloses a partial regenerator.

Looking next at the claim language, it should be noted that the Appellant is seeking patent protection for a method and not for the apparatus to which the method is applied. While the Appellant claims that the method can be applied to partial regenerators, nowhere does the Appellant claim the structure of the partial regenerators that would differentiate it from Roberts. Instead, the Appellant simply claims the method steps that are to be applied to the optical elements of the optical network that happen to include partial regenerators, partial regenerators which the Appellant admits are neither new nor invented by the Appellant (paragraph [0003] of the specification). In fact, the claim language at most indicates that the partial regenerators act as the location for dithering an optical signal. In doing so, the partial regenerators claimed appear to play only a small supporting role in the overall production of isolating faults in the optical path in that they merely serve as a place for introducing the true workhorse in isolating the faults in the system i.e. the dithered optical signal. There appearing to be no criticality in using a

partial regenerator per se, it stands to argue that any reference disclosing a method including a dithering step of an optical signal via an optical element would read on the claimed invention.

In a similar vain, Roberts discloses a method for isolating faults in an optical path of an optical network having a plurality of optical elements. Roberts further discloses a dithering mechanism which introduces a dithered optical signal into the system as claimed by the Appellant in that Roberts discloses optical amplifiers that can have their gains adjusted (column 7 lines 35-36). According to the Appellant, varying the gain of an optical amplifier is a readily recognizable method for introducing a dither control signal into an optical signal (paragraph [00023]). However, of greater consequence is the fact that Roberts specifically discloses that the method itself can be applied to other optical elements that process optical signals in an optical path (column 4 lines 31-35). In the examiner's opinion, the list of other optical elements to which Roberts' method is applicable would clearly include the admittedly well known partial regenerators, since they too process optical signals in an optical path.

Continuing this line of reasoning, it seems that granting a patent over Roberts or reversing the Roberts based rejection would in essence carve a small niche for partial regenerators in the intellectual property of Roberts which was intended to include and specifically lays claim by disclosure to all elements which process an optical signal in an optical path. This exception to the monopoly granted by the Office to Roberts would be akin to saying that Roberts' method is applicable and protected by the laws of the United States when applied to all elements which process an optical signal in an optical path except when those elements are partial regenerators, as this protection is granted to the Appellant. This is clearly a departure

from the purpose of granting patent protection to an Appellant and fundamentally contradicts the idea of intellectual property rights.

Turning to the claim structure, it is noted that the only indication of an order in performing the steps of the claimed method seems to come between the first clause ("transmitting ...") and second clause ("determining...") which are linked by a need to first transmit the optical signal including the embedded error detection data followed by determining an error rate at egress point of an optical network based on the embedded error detection data. It is clear that the transmitting clause must come before the determining clause since the embedded error detection data is needed to determine an error rate for the transmitted optical signal.

On the contrary, the third clause ("dithering...") and fourth clause ("monitoring...") of the claim are not sequentially linked to any of the previous clauses and can therefore, when given the broadest reasonable interpretation, occur at any time in the sequence except between the linked first and second clauses. Had the Appellant instead recited, "monitoring the error rate for the ***dithered*** optical signal," a clear sequential link between the third and fourth clauses would have been apparent. However, this is not the case, and therefore the Appellant's argument that Roberts dithers the optical signal by adjusting the gain of the optical amplifier as a remedial action once a fault is located is rendered moot. While not agreeing with the Appellant's assessment of Roberts' dithering action via adjustment of the optical amplifier's gain, the time at which Roberts performs the dithering is not relevant considering that the Appellant has not claimed a specific sequence of steps which requires the dither step to occur before a fault is located.

Finally, the Appellant recites a fifth clause ("thereby isolating..."), the fifth clause indicated by the Appellant's use of a semicolon that is punctuation generally reserved for separating independent clauses of a compound sentence. As a "thereby" clause it serves merely to state the result of the previously discussed limitations and does not itself add any patentable substance to the claim. It has been judicially determined that "thereby" and "whereby" clauses add no patentable subject matter to a claimed invention. *Israel v Cresswell, 166 F.2d 153, 156, 76 USPQ 594, 597 (CCPA 1948).* It has been further judicially determined that a "whereby" clause of a claim that expresses only necessary results of a structure already recited in the body of a claim should be given no weight as it add nothing to the structure of the claim. *The Lodge & Shipley company v. Holstein and Kappert G.m.b. H. (DC Stexas) 167 USPQ 625).* Given the above case law and the fact that the fifth clause is not sequentially linked to the previously discussed clauses, it can be said that Roberts meets the limitations of the claimed invention in that Roberts also discloses dithering an optical signal by varying an amplitude of the optical signal at a partial regenerator (i.e. according to the examiner's discussion above regarding a 1R regenerator). The case law further supports the argument that if the Appellant's dithering of an optical signal by varying an amplitude of the optical signal at a partial regenerator results in the ability to isolate faults, then Roberts' disclosure of dithering an optical signal by adjusting the gain of an optical amplifier will also result in the ability to isolate faults.

More concretely, the examiner further points out that Roberts does in fact meet the limitations presented by the fifth clause; i.e. isolation where a fault occurs in the optical network. Roberts clearly discloses monitoring of an error rate to identify the location of a fault (column 1 lines 5-26; column 3 lines 45-47; column 7 lines 23-30). Once located, remedial action is carried

out either manually or automatically with the remedial action including a "switching in" of redundant replacement units or protection switching (column 7 lines 30-52). When the network of Roberts performs this "switching in" of a redundant replacement unit or protection link, the network by definition is isolating the located fault in that it sets apart and quarantines the faulty equipment from the rest of the network and then selects redundant replacement units. In disclosing these features, it is clear that the network of Roberts isolates where a fault occurs in the optical network as claimed.

Turning to the balance of arguments in the Appellant's Brief, it is important to first note that that Appellant throughout the Brief argues that Roberts fails to teach how a partial regenerator might be used to isolate faults. However, the Appellant's claim language does not itself recite how the partial regenerators themselves are used to isolate faults. As discussed above, the claim language merely recites a method to be applied to an optical network of which partial regenerators are a part. Even more damning is the fact that the Appellant argues that even if Roberts teaches partial regenerators, they teach away from the *intended use* of partial regenerators as recited in the Appellant's claimed invention. However, it has been clearly established by the court that a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim.

Secondly, the Appellant argues that Roberts fails to teach introducing a control signal at different points along a path. However, neither a "control signal" nor an introduction of them at different points along an optical path claimed. Similarly, using partial regenerators to introduce

a control signal is not claimed. Rather, the claim language dictates that a transmitter introduce what the examiner presumes is meant by a control signal (e.g. "dither control signal" of claim 5) Regardless, Figures 6 and 8 clearly show what the examiner presumes are the limitations in question. Moreover, and as previously discussed, Roberts clearly teaches dithering an optical signal at each optical amplifier by varying the gain of the optical amplifier, which as noted by the Appellant is a readily recognizable method for introducing a dither control signal into an optical signal (paragraph [00023]). In the same context, Appellant further argues that Roberts requires additional equipment and implies that no other elements are used in the claimed invention. However, the claim language does not preclude the use of the additional equipment argued. To directly contradict the Appellant's arguments, it is noted that Roberts clearly discloses introducing a dither control by varying the gain of the optical amplifier, considered by the examiner to be a partial regenerator in that it is a 1R regenerator.

Thirdly, as discussed above, the Appellant's argument that Roberts introduces a dither control signal as a remedial action is rendered moot in view of the fact that the claim language fails to recite a specific order of method steps taken, and further since Roberts does teach isolation of a fault.

Lastly, the examiner notes that the combination of Roberts and Fatehi were used to meet the limitations of claim 6 and not Roberts alone. The examiner maintains that the combination of references teach the limitations of the claimed invention.

Given the various reasons stated above, the examiner respectfully request that the rejection based on Roberts and the combination of references be sustained.

**(11) Related Proceeding(s) Appendix**

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

A. Bello
AGUSTIN BELLO
PRIMARY EXAMINER

Conferees:

Jason Chan (SPE)

Jay Patel (SPE)

JASON CHAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600

JAY K. PATEL
SUPERVISORY PATENT EXAMINER